TRANSACTIONS

OF THE

American Society of Civil Engineers.

INDEX.

VOLUME XLIII.

JUNE, 1900.

NOTE.—In this Index, Subjects and Writers are given Alphabetically. Titles of Papers are enclosed by quotation marks when indexed alone or under the Author's name. When indexed under the name of a person discussing a paper, the titles are not so enclosed. Titles are entered with reference to the subject and also under the first significant word.

INDEX.

VOLUME XLIII.

JUNE, 1900.

"ADDRESS AT THE ANNUAL CONVENTION, LONDON, ENGland, July 2d, 1900." John Findley Wallace, President, 603.

"ALBANY WATER FILTRATION PLANT." Allen Hazen, 244.
Discussion: George I. Bailey, 296; W. B. Fuller, 302; P. A. Maignen, 306; George Hill, 307; A. M. Miller, 309; Rudolph Hering, 309; William P. Mason, 310; Charles E. Fowler, 311; G. W. Fuller, 313; George C. Whipple, 316; George W. Rafter, 324; G. L. Christian, 327; John C. Trautwine, Jr., 327; George A. Soper, 342; Allen Hazen, 345.

ALUMINUM.
"Experiments on the Protection of Steel and—— Exposed to Water." A. H. Sabin. (With Discussion.) 444.

ARCHES.
"Comparison of Weights of a Three-hinged and a Two-hinged Spandrel-Braced Parabolic Arch." C. W. Hudson. (With Discussion.) 20.
"The Groined Arch as a Covering for Reservoirs and Sand Filters: Its Strength and Volume." Leonard Metcalf. (With Discussion.) 37.

BACTERIA.
"Albany Water Filtration Plant." Allen Hazen. (With Discussion.) 244.

BAILEY, GEORGE I. Albany Water Filtration Plant, 296.

BREAKWATERS.
"The Reaction Breakwater as Applied to the Improvement of Ocean Bars." (Continuation of the Discussion on Paper No. 863, in *Transactions*, Vol. XLII, p. 485.)

BRIDGES.
"Comparison of Weights of a Three-hinged and a Two-hinged Spandrel-Braced Parabolic Arch." C. W. Hudson. (With Discussion.) 20.
"The Exact Design of Statically Indeterminate Frameworks. An Exposition of its Possibility, but Futility." Frank H. Cilley. (With Discussion.) 353.
BROOMALL, C. M. Tests of Structural Steel, 17.
BUCK, L. L. Protective Coatings for Steel, etc., 462.
BUILDINGS.
Cost of— South Terminal Station, Boston, Mass. George B. Francis, 165.
CANALS.
"Improvement of a Portion of the Jordan Level of the Erie Canal." William B. Landreth. (With Discussion.) 566.
CEMENT.
For South Terminal Station, Boston, Mass. George B. Francis, 118.
For Albany Water Filtration Plant. Allen Hazen, 279.
CHRISTIAN, G. L. Albany Water Filtration Plant, 327.
CILLEY, FRANK H. "The Exact Design of Statically Indeterminate Frameworks. An Exposition of Its Possibility, but Futility," 353, 426.
COFFER DAM.
For South Terminal Station, Boston, Mass. George B. Francis, 113.
"COMPARISON OF WEIGHTS OF A THREE-HINGED AND A Two-hinged Spandrel-Braced Parabolic Arch." C. W. Hudson, 20.
Discussion: Henry S. Jacoby, 31; C. W. Hudson, 35.
CONCRETE.
For South Terminal Station, Boston, Mass. George B. Francis, 116.
For Albany Water Filtration Plant. Allen Hazen, 279; W. B. Fuller, 303.
CONROW, HERMAN. Waterproofing, 172.
COOLEY, L. E.
Jordan Level, Erie Canal, 598.
Quicksand, 598.
CORTHELL, E. L. Breakwaters and Jetties, 102.
CURRIER, CHARLES G. Filtration, 84.
DAMS.
"Foundations of the New Croton Dam." Charles S. Gowen. (With Discussion.) 469.

DICKINSON, POMEROY P. Memoir of— 611.

DIETZ, W. Indeterminate Frameworks, 421.

ELEVATORS.

Used in South Terminal Station, Boston, Mass. George B. Francis, 155.

ERIE CANAL.

"Improvement of a Portion of the Jordan Level of the—" William B. Landreth. (With Discussion.) 566.

"EXACT DESIGN OF STATICALLY INDETERMINATE FRAMEworks. An Exposition of Its Possibility, but Futility." Frank H. Cilley, 353.

Discussion: Henry Goldmark, 408; Gustav Lindenthal, 410; C. W. Ritter, 417; W. Dietz, 421; Joseph Sohn, 424; G. Jung, 425; Frank H. Cilley, 426.

"EXPERIMENTS ON THE PROTECTION OF STEEL AND Aluminum Exposed to Water." A. H. Sabin, 444.

Discussion: L. L. Buck, 462; George Hill, 462; F. W. Skinner, 463; Thomas D. Pitts, 463; George Tatnall, 464; Oscar Lowinson, 465; A. H. Sabin, 466.

FILTERS.

"The Albany Water Filtration Plant." Allen Hazen. (With Discussion.) 244.

"The Groined Arch as a Covering for Reservoirs and Sand—: Its Strength and Volume." Leonard Metcalf. (With Discussion.) 37.

"Test of a Mechanical Filter." Edmund B. Weston. (With Discussion.) 69.

FLOORS.

Steel Flooring used in South Terminal Station, Boston, Mass. George B. Francis, 126, 127.

"FOUNDATIONS OF THE NEW CROTON DAM." Charles S. Gowen, 469.

Discussion: E. Sherman Gould, 543; George W. Rafter, 551; L. J. LeConte, 554; J. L. Power O'Hanly, 555; Charles S. Gowen, 560.

FOWLER, CHARLES E. Albany Water Filtration Plant, 311.

FRANCIS, GEORGE B. "The South Terminal Station, Boston, Mass." 107.

FROGS.

Used in South Terminal Station, Boston, Mass. George B. Francis, 125.

FULLER, GEORGE W.

Filtration, 79.

Albany Water Filtration Plant, 313.

FULLER, WILLIAM B.
Groined Arches, 63.
Albany Water Filtration Plant, 302.

GILLHAM, ROBERT. Memoir of— 613.

GOLDMARK, HENRY. Indeterminate Frameworks, 408.

GOULD, E. SHERMAN.
Filtration, 83.
Foundations of New Croton Dam, 543.

GOWEN, CHARLES S. "Foundations of the New Croton Dam," 469, 560.

"GROINED ARCH AS A COVERING FOR RESERVOIRS AND Sand Filters: Its Strength and Volume." Leonard Metcalf, 37.
Discussion: L. J. Le Conte, 60; William R. Hutton, 60; Allen Hazen, 61; William B. Fuller, 63; Leonard Metcalf, 66.

HARDING, HORACE. Memoir of— 618.

HAUPT, LEWIS M. "The Reaction Breakwater, as Applied to the Improvement of Ocean Bars." 104.

HAZEN, ALLEN.
Groined Arches, 61.
"The Albany Water Filtration Plant." 244, 345.
Quicksand, 582.

HEATING AND VENTILATING.
In South Terminal Station, Boston, Mass. George B. Francis, 156.

HERING, RUDOLPH. Albany Water Filtration Plant, 309.

HILL, GEORGE.
Albany Water Filtration Plant. 307.
Protective Coatings for Steel, etc., 462.
Quicksand, 592.

HUDSON, C. W. "Comparison of Weights of a Three-hinged and a Two-hinged Spandrel-Braced Parabolic Arch," 20, 35.

HUTTON, WILLIAM R. Groined Arches, 60.

HYDRAULICS.
"River —" James A. Seddon. (With Discussion.) 179.

"IMPACT TESTS OF STRUCTURAL STEEL." S. Bent Russell, 1.
Discussion: C. M. Broomall, 17; S. Bent Russell, 17.

"IMPROVEMENT OF A PORTION OF THE JORDAN LEVEL of the Erie Canal." William B. Landreth, 566.
Discussion: Allen Hazen, 582; George W. Rafter, 585; Edward P. North, 587; James Owen, 591; George Hill, 592; J. G. Tait, 593; Samuel Whinery, 594; L. J. Le Conte, 595; Clifford Richardson, 596; L. E. Cooley, 598; William B. Landreth, 601.

JACOBY, HENRY S. Three-hinged and Two-hinged Arches, 31.

JETTIES.

See *Breakwaters.*

JUNG, G. Indeterminate Frameworks, 425.

LANDRETH, WILLIAM B. "Improvement of a Portion of the Jordan Level of the Erie Canal," 566, 601.

LE BARON, J. FRANCIS. Breakwaters and Jetties, 95.

LE CONTE, L. J.

Groined Arches, 60.
River Hydraulics, 236.
Foundations of the New Croton Dam, 554.
Jordan Level, Erie Canal, 595.

LINDENTHAL, GUSTAV. Indeterminate Frameworks, 410.

LOWINSON, OSCAR. Protective Coatings for Steel, etc., 465.

MAIGNEN, P. A. Albany Water Filtration Plant, 306.

MASON, WILLIAM P. Albany Water Filtration Plant, 310.

MASONRY.

Albany Filtration Plant. Allen Hazen, 282, 347; George W. Rafter, 325; G. L. Christian, 327.

Foundations of the New Croton Dam. Charles S. Gowen, 469, 560; E. Sherman Gould, 543; L. J. Le Conte, 554; J. L. Power O'Hanly, 555.

MEMOIRS.

Pomeroy P. Dickinson, 611.
Robert Gillham, 613.
Horace Harding, 618.

METCALF, LEONARD. "The Groined Arch as a Covering for Reservoirs and Sand Filters: Its Strength and Volume." 37, 66.

MILLER, A. M. Albany Water Filtration Plant, 309.

MISSISSIPPI RIVER.

"River Hydraulics." James A. Seddon. (With Discussion.) 179.

MISSOURI RIVER.

"River Hydraulics." James A. Seddon. (With Discussion.) 179.

NORTH, EDWARD P.

Jordan Level, Erie Canal, 587.
Quicksand, 590.

O'HANLY, J. L. POWER. Foundations of the New Croton Dam, 555.

OWEN, JAMES. Quicksand, 591.

PAINT.
Used in South Terminal Station, Boston, Mass. George B. Francis, 126.
"Experiments on the Protection of Steel and Aluminum Exposed to Water." A. H. Sabin. (With Discussion.) 444.
PHILADELPHIA, PA.
Filtration of — Water Supply. John C. Trautwine, Jr., 327.
PILES.
For South Terminal Station, Boston, Mass. George B. Francis, 109, 116.
PITTS, THOMAS D. Protective Coatings for Steel, etc., 463.
QUICKSAND.
"Improvement of a Portion of the Jordan Level of the Erie Canal." William B. Landreth. (With Discussion.) 566.
RAFTER, GEORGE W.
River Hydraulics, 235.
Albany Water Filtration Plant, 324.
Foundations of the New Croton Dam, 551.
Jordan Level, Erie Canal, 585.
RAILROADS, STATIONS.
"The South Terminal Station, Boston, Mass." George B. Francis. (With Discussion.) 107.
RAILS.
Used in South Terminal Station, Boston, Mass. George B. Francis, 125.
RAILWAY SIGNALING.
Interlocking system used in South Terminal Station, Boston, Mass. George B. Francis, 141.
"REACTION BREAKWATER, AS APPLIED TO THE IMPROVEMENT of Ocean Bars." (Continuation of the Discussion on Paper No. 863, in *Transactions*, Vol. XLII, p. 485.) George Y. Wisner, 93; J. Francis Le Baron, 95; Gardner S. Williams, 101; E. L. Corthell, 102; A. F. Wrotnowski, 103; Lewis M. Haupt, 104.
RESERVOIRS.
"The Groined Arch as a Covering for — and Sand Filters: Its Strength and Volume." Leonard Metcalf. (With Discussion.) 37.
RESILIENCE.
"Impact Tests of Structural Steel." S. Bent Russell. (With Discussion,) 1.
RICHARDSON, CLIFFORD. Quicksand, 596.
RITTER, C. W. Indeterminate Frameworks, 417.

"RIVER HYDRAULICS." James A. Seddon, 179.
Discussion: A. Miller Todd, 230; George W. Rafter, 235; L. J. Le Conte, 236; James A. Seddon, 237.

ROOFS.
For South Terminal Station, Boston, Mass. George B. Francis, 135; J. R. Worcester, 175.

RUSSELL, S. BENT. "Impact Tests of Structural Steel." 1, 17.

SABIN, A. H. "Experiments on the Protection of Steel and Aluminum Exposed to Water." 444, 466.

SAND.
"The Albany Water Filtration Works." Allen Hazen. (With Discussion.) 244.
See also *Quicksand.*

SEDDON, JAMES A. "River Hydraulics." 179, 237.

SKINNER, F. W. Protective Coatings for Steel, etc., 463.

SOHN, JOSEPH. Indeterminate Frameworks, 424.

SOPER, GEORGE A. Albany Water Filtration Plant, 342.

"SOUTH TERMINAL STATION, BOSTON, MASS." George B. Francis, 107.
Discussion: Herman Conrow, 172; J. R. Worcester, 175.

STEEL.
"Impact Tests of Structural—." S. Bent Russell. (With Discussion.) 1.
Used in South Terminal Station, Boston, Mass. George B. Francis, 128; J. R. Worcester, 175.
"Experiments on the Protection of— and Aluminum Exposed to Water." A. H. Sabin. (With Discussion.) 444.

STONE.
For South Terminal Station, Boston, Mass. George B. Francis, 119.

SWITCHES.
Used in South Terminal Station, Boston, Mass. George B. Francis, 125.

TAIT, J. G.
Jordan Level, Erie Canal, 593.
Quicksand, 594.

TATNALL, GEORGE. Protective Coatings for Steel, etc., 464.

"TEST OF MECHANICAL FILTER." Edmund B. Weston, 69.
Discussion: Gardner S. Williams, 79; George W. Fuller, 79; E. Sherman Gould, 83; Charles G. Currier, 84; Edmund B. Weston, 87.

TESTS.
"Impact— of Structural Steel." S. Bent Russell. (With Discussion.) 1.
"Test of a Mechanical Filter." Edmund B. Weston. (With Discussion.) 69.

TIES.
Used in South Terminal Station, Boston, Mass. George B. Francis, 126.

TODD, A. MILLER. River Hydraulics, 230.

TRACK.
Arrangement of— South Terminal Station, Boston, Mass. George B. Francis, 123.

TRAIN INDICATORS.
Used in South Terminal Station, Boston, Mass. George B. Francis, 128.

TRAUTWINE, JOHN C., Jr.
Albany Water Filtration Plant, 327.
Philadelphia Water Filtration, 327.

WALLACE, JOHN FINDLEY. "Address at the Annual Convention, London, England, July 2d, 1900." 603.

WATER SUPPLY.
"Albany Water Filtration Plant." Allen Hazen. (With Discussion.) 244.

WATERPROOFING.
For South Terminal Station, Boston, Mass. George B. Francis, 114.
For a Subway. Herman Conrow, 172.

WESTON, EDMUND B. "Test of a Mechanical Filter," 69, 87.

WHINERY, SAMUEL. Quicksand, 594.

WHIPPLE, GEORGE C. Albany Water Filtration Plant, 316.

WILLIAMS, GARDNER S.
Filtration, 79.
Breakwaters and Jetties, 101.

WISNER, GEORGE Y. Breakwaters and Jetties, 93.

WORCESTER, J. R. Steel-work for Train Shed of South Terminal Station, Boston, Mass., 175.

WROTNOWSKI, A. F. Breakwaters and Jetties, 103.